



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/648,570	08/26/2003	Samuel D. Naffziger	200208858-1	4101

22879 7590 10/05/2005  
HEWLETT PACKARD COMPANY  
P O BOX 272400, 3404 E. HARMONY ROAD  
INTELLECTUAL PROPERTY ADMINISTRATION  
FORT COLLINS, CO 80527-2400

EXAMINER

SHINGLETON, MICHAEL B

ART UNIT PAPER NUMBER

2817

DATE MAILED: 10/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/648,570

Examiner

Michael B. Shingleton

Applicant(s)

NAFFZIGER ET AL.

Art Unit

2817

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 7-14-2005
- 1) ☒ Responsive to communication(s) filed on ~~28 February 2005~~
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) 8, 13, 14, 19 and 31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7, 12, 15-17 and 20-26 is/are rejected.
- 7) ☒ Claim(s) 9-11, 18 and 27-30 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date: \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

The drawing changes are approved by the examiner

*Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-7, 12, 15-17, and 20-25 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Holler, Jr. et al. 5,416,446 (Holler).

Figures 1 and 2 and the relevant text of Holler discloses a system having a frequency generator 102, Figure 2 that provides a "clock" signal for use by element 103 and 104. The signal produced by element 102 qualifies as a clock signal as it provides a timing signal that is applied to element 104. The examiner notes that no specific definition is set forth by applicant in the disclosure. Also the examiner must give the broadest reasonable interpretation to the claim terms (See MPEP 2111). This frequency generator 102 has a frequency that is based on an operating voltage like  $V_{DDR}$  in Figure 2. The voltage  $V_{DDR}$  changes with changes in the current supplied via elements like 204 and because of changes in  $V_{DD}$ . A change in current through elements like 204 will cause the  $V_{DDR}$  voltage to change which in turn causes a change in the frequency (See column 2, around line 60). Note that in order for there to be more current through the delay elements, the voltage must increase in value. The controller is composed of elements like 108, 110, 111 and 101. This controller provides a control signal to the transistors in elements like 204 (See Figures 1 and 2). This control signal is based on adjustments in frequency controlled in part by the sensing of the frequency via elements like 108 (See column 3, around line 60). A throttle event according to applicant can include a change in frequency do to a change in the supply voltage. As noted above if the supply voltage like  $V_{DD}$  is changed then the supply voltage  $V_{DDR}$  changes then a throttle event occurred. Claims like claim 16 recites a means for providing an indication of voltage induced throttle events for an integrated circuit. First the circuit of Holler is an integrated circuit (See column 1, around line 64). When a change in the supply voltage  $V_{DDR}$  occurs then the frequency output as noted above will change and this gives an indication of a voltage induced throttle event like that of applicant's invention. Because of the change in the frequency, this is sensed as noted above and is changed accordingly. Thus this control circuit forms the means for controlling the supply voltage  $V_{DDR}$  of the integrated circuit based

in the indication of throttle events i.e. the change in frequency. This structure indicated above also provides for the method steps of "determining whether adjustments to an operating frequency of an integrated circuit are within expected operating parameters (Note the sensing of the frequency as noted above.). These adjustments are clearly made continuously and this are performed over a "cycle time" that includes a plurality of cycles at the operating frequency. As noted above the supply voltage  $V_{DDR}$  is adjusted based on the determination of the frequency. Note with respect to claims like claim 2 the fixed frequency is the second signal from element 105 (Element 105 would be the second frequency generator of claims like claim 12.) and the signal at the output of element 102 would be the first signal. Because the adjustments are made continuously the control signal is based on a number of cycles of the first signal relative to the number of cycles of the second signal over a cycle time. The cycle time can be any amount of time that includes at least two cycles of the first and second signals. Note that a comparator 110 is operative to ascertain the measurement of frequency that provides an indication of throttle events associated with the frequency generator implementing changes to the frequency of the clock signal (Output of element 102), the controller as noted above then clearly provides the control signal based on the indication of the throttle events. These indications of throttle events are compared to a "threshold value" that is a result of the output of register 109 (See the paragraph bridging columns 3 and 4). As noted above the control signal provides for control of the supply voltage  $V_{DDR}$  (the reference signal of claims like claim 5.). The control signal is clearly based on the comparator signal. The threshold is clearly programmable because of the signal "REFERENCE". The paragraph bridging columns 3 and 4 of Holler recites that the threshold value can be indicative of which way the frequency needs to be changed, i.e. "faster or slower". Thus the selection of the threshold value in Holler is a selection of one of the first and second operating categories, i.e. whether the operating voltage is too low or too high. The second signal from the second frequency generator for a set "sampling interval" will determine the maximum frequency for the clock signal as this number of cycles of the second signal over a set sampling interval determines the maximum amount the counter can be changed over the set sampling interval. Note that the "known interval" i.e. the sampling interval is set by the crystal 106 of the fixed frequency oscillator. This determines the number of cycles for the clock signal relative to a number of cycles of the second signal having a fixed frequency which is a measurement of frequency, which as indicated above, is an indication of "throttle events" associated with changes in a frequency of the clock signal. The controller composed of elements like 108, 110, 111 and 101 implements the control of the supply voltage  $V_{DDR}$  on a cycle time i.e. sampling interval. Since this controller is part of a feedback loop as is clearly illustrated by Figure 1 it is considered a "power control loop". The cycle time (second cycle time of claims like claim 25) is

Art Unit: 2817

clearly greater than a cycle time (first cycle time of claims like claim 25), i.e. period of one cycle of the clock signal for the sampling interval (Again see the paragraph bridging columns 3 and 4 and in particular note that the counter 108 counts the number of "cycles" of the ring oscillator.

*Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Holler, Jr. et al. 5,416,446 (Holler).

All the reasoning applied in the above 35 USC 102 rejection involving Holler and the following. Holler is silent on the exact length of the sampling period or "second cycle time". The sampling period clearly contains "cycles" of the first cycle time but is silent on exactly how many cycles. However, the number of cycles is a result effective variable as this determines the maximum and minimum frequencies. As this involves but routine skill in the art, the selection of "about one hundred times greater than the first cycle time" would have been obvious to one of ordinary skill in the art at the time the invention was made.

*Allowable Subject Matter*

Claims 9-11, 18 and 27-30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicant's arguments filed 7-14-2005 have been fully considered but they are not persuasive.

Applicant believes that the voltage  $V_{DDR}$  is constant i.e. non-changing. However Holler specifically recites that the "voltage is controlled" (See column 2, around line 55). Also the examiner does not see where in Holler that Holler describes transistor 222 as being saturated. Transistor 222 provides a minimum voltage because it supplies a minimum current. If applicant's position was correct that a constant unchanging voltage is supplied then the delay of the inverters would not change for they

Art Unit: 2817

would always draw the same current. The old analogy to water applies here. In order to have more water flow (current) you need more pressure(voltage). Potential to electricity is like pressure to water and current is like flow in water. In order for the current to increase through a load the potential has to increase. Holler clearly recites that the current draw is changed and therefore the voltage must also change in accordance with Ohms law.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael B. Shingleton whose telephone number is (571) 272-1770.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal, can be reached on (571)272-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306 and after July 15, 2005 the fax number will be 571-273-8300. Note that old fax number (703-872-9306) will be service until September 15, 2005.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

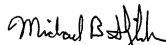
Application/Control Number: 10/648,570

Page 6

Art Unit: 2817

MBS

September 23, 2005

A handwritten signature in black ink, appearing to read "Michael B. Shingleton".

Michael B Shingleton  
Primary Examiner  
Group Art Unit 2817